

apterite to do their work. The sacks are put on the top of the soil to keep the fumes in.

#### **Covering:**

Instead of seed frames plain wire-netting is used. The netting is pegged down on either side, thus forming a hoop over the top. As soon as the seedlings are up and past all danger from birds, the wire-netting is rolled up and stored away ready for use the next year.

#### **Weeding:**

Is carried out from time to time. Sorrel is the most prevalent weed.

#### **Wrenching:**

In the Autumn, after good rains, the seedlings are wrenching by prying them up with a spade on either side, and tramping them down again.

The conditions aimed at in the nursery are a soil rich in organic matter, free as possible from weeds and insect pests, sufficiently deep and well cultivated to provide good drainage, and close enough to secure capillarity. As most of the trees are planted straight from the seed beds within twelve months of seed sowing, it is important to secure rapid growth and satisfactory root development.

In growing *Macrocarpa* the seed is sown broadcast in prepared beds. As soon as the seedlings are large enough to handle they are lifted and pricked out into shallow boxes filled with a light brown loam; seventy-two seedlings are put into each box—nine rows of eight. These boxes are placed in the greenhouse and kept there till well established, and then they are placed out in an open, sunny position to harden off in preparation for planting. This has proved a most successful method of growing *Macrocarpa*, very few failures being recorded amongst those planted out. The redwoods are raised from cuttings. The poplars are increased by means of cuttings made from pieces of well-ripened twigs nine to ten inches in height. The base of each cutting is cut across just below a node. These cuttings are then lined out in rows about two inches apart and buried about two-thirds of their length in the ground.

Average cost of seedlings, last year, was £1 per thousand.

The following is a list of trees raised from seed:—

<i>Pinus radiata</i>	.. .. .	145,600
Douglas Fir	.. .. .	104,200
<i>Pinus ponderosa</i>	.. .. .	13,000
<i>Cupressus Macrocarpa</i>	.. .. .	21,300
Larch	.. .. .	1,000
Poplars	.. .. .	280

Total .. .. . 285,380

The trees are transported to the plantations by means of a small Ford truck.

#### **Mixed Planting:**

Not very much mixed planting has been tried. At Whare Flat a small patch of Norway

Spruce and Oaks was tried. The Norway Spruce has, for the most part, failed, but the Oaks among them are doing satisfactorily.

In an area where Douglas Fir and Larch were planted together it is noticeable that the larch was too strong for the Douglas Fir, and has, in most cases, crowded it out and overtopped it.

The plantations have, so far, been very free from disease. The only trees suffering were the Menzies, Norway and American Spruce. These were attacked some years ago by aphid, and have now almost recovered, but no more spruce have been planted for years.

#### **Planting on the Sandhills:**

Along the coast at Ocean Beach and St. Clair fairly extensive sand-dune planting has been done. *P. radiata* was the tree planted, and it is making fine, healthy plantations.

#### **Concluding Remarks:**

The area of trees planted to date is 3000 acres. The ultimate aim is 30,000 acres, which is the area estimated to be necessary to supply the timber needs of Dunedin. At present there is a strong agitation by the Dunedin Chamber of Commerce for the planting of all the poor hill land round about Dunedin. Dunedin has thousands of acres of bare, hilly land surrounding the city, which is of very little use for agriculture. The proposal is that all these areas should be planted with trees. This would result in the City Council getting control of Signal Hill, Flagstaff and Mt. Cargill.

The plantations have already suppressed such undesirable growths as broom, gorse and manuka scrub; they have reduced the rabbit nuisance to a minimum; have greatly increased the efficiency of the water catchment areas; and increased greatly the beauty of the landscape, healthy plantations taking the place of bare hillside or patches of burnt and partly-burnt manuka scrub, gorse, and broom.

## **CLUB AND SCHOOL JOTTINGS.**

### **FORESTRY CLUB.**

At the first ordinary meeting, held on May 14th, 1926, Mr. Foweraker, the retiring president, outlined the work of the past year, and read encouraging letters received about "Te Kura Ngahere."

The following new members were welcomed into the Club:—

**R. J. McLaren**, who was educated at Timaru High School. Some months of nursery work in the State Forest Service at Hanmer led to his meeting with several of the present students there, and opened up the possibilities of forestry as a profession. He is taking a three-year Ranger course.

**W. S. Tannock**, the son of Mr. D. Tannock, Superintendent of Gardens and Reserves, Dunedin, spent some time at McGlashan's College there, and then became engaged in forestry work on the Dunedin reserves. He is taking a two-year course with the idea of specialising in silviculture.

**A. W. Russell** was educated at Dunstable School, England, gaining a London Matric., and a Cambridge Higher Local Certificate. Coming to New Zealand a year ago he was attracted to the profession by meeting members of the State Forest Service. He is taking the Degree Course.

The following officers of the year were then elected:—Mr. Hutchinson, President; Mr. Hamilton, Vice-President; Mr. Skipworth, Secretary-Treasurer; and these officers, with Mr. McLaren, to form the executive committee. Fortnightly meetings were arranged for the remainder of the year, and Messrs. Foweraker, Hutchinson, Russell and the Secretary were elected an editorial committee for "Te Kura Ngahere."

Mr. Hutchinson read, as his presidential address, a paper on "Field Cruising Technique in the Inland Empire of the United States." He dealt with the cruising and topographical survey of a rough timber area in the Kaniku National Forest in Idaho, on which he was engaged in 1923. He detailed the general plan of the work, and explained many interesting points. His description of the general mode of living whilst engaged on such field parties was most illuminating. A discussion of points which had arisen followed, Mr. Hutchinson answering many questions.

At the second meeting, held on April 28th, Mr. Hamilton read a paper on "Seeding Problems at Hanmer." He examined the various methods of nursery practice in use at the State Forest Service plantations there, detailing the difficulties met with and how these were overcome, and experimental work carried on to this end. Costs of the various methods were given, and the problem of weed suppression discussed.

The next meeting was held on June 16th, when Mr. Foweraker read a paper on "The Ascent of Sap in Trees." He pointed out the great importance attached to the study of this subject. He first dealt briefly with the structures of the root and stem involved in the process of ascent of sap, and explained the course taken by the sap in its ascent. Secondly, he gave a short outline of the history of investigation of the subject, and then went on to deal with the chief modern theory of the causes of the phenomenon, viz., **Dixon's Cohesion Theory**. According to this theory the crude sap forms a more or less continuous series of columns in the conducting elements of the wood, and these columns terminate in the small

leaf veins. Evaporation of water from the leaf cells provides a tractive force, which pulls upwards the sap columns which, owing to the cohesion of the sap, are not broken. It had been shown experimentally that in a tree 300ft. high a tension of about 20 atmospheres is produced. Lastly a brief exposition of a more recent theory by Bose was given. According to this theory the thin cylinder of living cortical cells just beneath the bark acts as a pump, and by rhythmical contractions forces the sap upwards.

There were many difficulties that beset the investigator of sap ascent, and the problem is not yet completely solved.

On June 30th Mr. Russell read a paper on "The History of Forestry in Britain." A brief survey of the extent of forests covering Great Britain was followed by a summary of British history as it shed light on Forestry, and a sketch of the laws governing Forestry which arose therefrom. An outline of the present state of things, and of the state of apathy in this regard which held in the nineteenth century, concluded the paper, subsequent discussion bringing out the fact that New Zealand presents, on a smaller scale, a parallel to the history of British forestry.

Mr. Barker's paper on "The Anatomy of New Zealand Woods, Part I., Laboratory Technique," delivered at the next ordinary meeting, July 14th, is printed in full elsewhere.

On July 28th Mr. Hutchinson read a paper dealing with "The Manufacture of Newsprint Paper in Canada, Part II.," being a continuation of the address given by him the previous year in which the activities of the Forestry Department of a large paper-making firm were detailed. In this second section, Mr. Hutchinson dealt first with the actual process of manufacture by which the spruce logs are turned into paper, and second with the organisation side of the whole field of a business enterprise in paper-making. For the first part Mr. Hutchinson, with the aid of photographs, followed through the barking and cutting of the logs, the reduction of the billets by grinding, the manufacture of sulphurous acid, and the chemical reduction resulting in the formation of pulp, followed by a description of the washing, beating, loading, and final manufacture on the marvellously ingenious Fourdrinier wire, or paper machine, finishing with the testing of strength, baling and loading for shipment.

In the second part, Mr. Hutchinson sketched lightly the organisation of a typical large paper-making unit, drawing attention to the scope of the enterprise, capital investment, the need for careful correlation of many factors in the planning of an efficient enterprise, the human side of business, questions of housing and social provisions necessary in the employment of labour on a large scale, economies in operation of mill and bush, and kindred

factors, with reference to the conditions which would govern the establishment of an enterprise of this nature in New Zealand.

Mr. Tannock's paper on "The Afforestation Work of the Dunedin City Corporation," delivered on August 11th, is also printed in full in this number.

On September 22nd Mr. Roche read an illuminating address on "The Timbering of the Otira Tunnel." In order to give a comprehensive view of the whole subject, he started by describing the surveying of the tunnel and the formation of the drive, and then proceeded to detail the placing of the timbet sets used in the process, their treatment and the amount of timber used in their construction, showing blue-prints and drawings to amplify his descriptions. He went on to particularise in the case of the Otira Tunnel, in the construction of which he took an active part, illustrating his remarks from an apparently inexhaustible fund of breezy anecdote.

At the last ordinary meeting Mr. McLaren read a paper on "The Afforestation of Sand Dunes." Starting with the extent and situation of the chief dune areas of the world, and the importance and necessity of their afforestation, he then detailed types of dunes and methods of fixation dealing with barriers, and especially with the planting up by such sand-binding plants as Marram grass, etc. He then mentioned the best species of trees for dune afforestation, and described the methods and progress with tree-planting in some sand-dune areas in New Zealand.

#### **The First Annual Dinner.**

As a fitting close to the year, and in view of the fact that our vice-president was leaving us to take up a position with the State Forest Service, it was decided to inaugurate the custom of an annual dinner of the Club. Accordingly, on the 27th October, the Club assembled as the guests of Mr. and Mrs. Foweraker at their home in Hackthorne Road, to enjoy a most delicious meal, followed by an evening of jollity and good fellowship.

Three members were unavoidably absent, two with illness, and one through official duty, but these unfortunates were appropriately remembered, and at the singing of "Auld Lang Syne" the Club terminated its activities for the second year of its career.

#### **HANMER SPRINGS: TERM VACATION, 1926.**

Hanmer must have stepped straight out of Hans Andersen, I think. That winter afternoon, when first we arrived, Skipworth, Clark and I, there was a bright sun giving us long shadows, but no warmth, and Hanmer was faintly haloed serenely golden. There's Conical Hill, with its improbable symmetry, the little house on top, the boulder balanced

on the very point of tumbling—so it seems—from the hill's summit: the whole made one think of wizardry, and impossible tasks for the hand of a princess more lovely than the world had known; who but a spinner of fairy tales had imagined it? And then the orderly plantations of young pines and long vistas of saplings in a cool gloom, leading down to a clear tumbling brook and upward to snow-capped hills. Hans I thought of that first day, and the association will not fade.

Well, we arrived that Saturday (I forget the date, but that doesn't matter), secured a four-roomed whare which promised to be very comfortable, and settled in. Sunday we spent in chopping wood and strolling round the village; our fame had gone like wildfire before us, and everyone recognised "the students." Next day we started in pulling the seedlings mostly; Skip spent the first week or so in this way at the nursery, but Arthur and I were promoted to path-making round about the new office for a time. After this we were all on burning, digging, scraping, shovelling; making new cart-tracks and clearing the creek to make all shipshape for the expected floods. Skip and I spent, too, a few days knocking pinaster cones—great sport! You must picture him and me (neither of us a flyweight) jumping up and down at the end of a swaying branch, which sagged further towards the ground as we stretched out, just one inch more to be within cudgel-range of that bunch of cones so temptingly placed at the tippermost part of the branch above; and whacking wildly at refractory cones, whilst dead ones fell on our heads and the wind laughed at us: now put the whole picture on top of a howling precipice, with the Waiau River tearing through the gorge two hundred feet below—picture this, and if you use a fair amount of incredulity you will get a moderately accurate idea of our antics.

But it's not so much the work, perhaps, that sticks in the mind (am I a traitor to my profession. Never.) as certain "off" times. Choruses of imprecations shrieked at that stove; it makes my blood boil even now to think of it. Oh! but one morning Skip and I decided to be lazy; we would do without the fire for breakfast—nothing hot, and there were twenty degrees or so of frost, and the sun not up over the surrounding hills till nine or so. But that stove—it would have excused worse follies. . . . Well, up we got, later than usual, as there was no fire to light; shivered over our icy wash, our clammy bread, our solid butter, jam that was cold comfort at best; put on our stiff, muddy boots, and were starting off, hungry and bad-tempered, when an eye (I don't know whether his or mine) fell on the Wooster's Great Pepsin Cough Preserver, which had been bought for some small cough or other. Together we dashed at the bottle, and let the fiery syrup trickle down our throats. It